

DOUBLE-IMPLANT HIGH PERFORMANCE VARACTOR AND METHOD FOR MANUFACTURING SAME

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ABSTRACT

A varactor designed to enable voltage controlled oscillator (VCO) integration in wireless systems is the base-emitter junction of a specially optimized NPN device formed with a double base implant. A first, shallow implant optimizes capacitance, leakage current, and tuning range. A second, deeper base implant is used to improve the quality factor of the device by reducing the base resistance. The varactor includes a third terminal (collector), which isolates the emitter-base junction from the substrate, providing flexibility in circuit applications. A method for fabricating a high performance varactor having the above-described structure is also provided.